

WHAT IS CLAIMED IS:

1. A method for depositing a doped polysilicon film comprising:
providing a surface; and
substantially simultaneously flowing SiH_4 and BCl_3 over the surface at a temperature less than or equal to about 500 degrees Celsius under conditions that achieve an average concentration in the doped polysilicon film of between about 7×10^{20} and about 3×10^{21} boron atoms per cubic centimeter.
2. The method of claim 1 wherein the temperature is between about 450 and about 480 degrees Celsius.
3. The method of claim 2 wherein pressure is between about 200 mTorr and about 1 Torr.
4. The method of claim 3 wherein an inert gas is flowed over the surface with the SiH_4 and BCl_3 .
5. The method of claim 4 wherein the inert gas is helium.
6. A method for forming in-situ doped polysilicon comprising:
providing a surface; and
substantially simultaneously flowing a first source gas comprising SiH_4 and a second source gas comprising BCl_3 over the surface at a temperature less than about 500 degrees Celsius under conditions sufficient to achieve in the doped polysilicon an average concentration of between about 7×10^{20} and about 3×10^{21} boron atoms per cubic centimeter.
7. The method of claim 6, wherein the second source gas comprises about 0.1 percent BCl_3 or more.

8. The method of claim 7, wherein the second source gas further comprises an inert gas.
9. The method of claim 8, wherein the temperature is between about 450 and about 480 degrees Celsius.
10. The method of claim 9, wherein the inert gas is helium.
11. The method of claim 8, wherein the pressure is between about 200 mTorr and about 1 Torr.
12. A method for depositing in-situ doped polysilicon comprising:
 - providing a substrate comprising a substantially horizontal surface and a substantially vertical sidewall descending from the horizontal surface, the sidewall having a top; and
 - depositing an in-situ doped polysilicon film on the surface at a temperature less than about 500 degrees Celsius, wherein:
 - a first thickness of the film at its thinnest point on the vertical sidewall is at least 80 percent of a second thickness of the film on the sidewall at the top of the sidewall, and
 - a third thickness of the film on the horizontal surface is at least 200 angstroms.
13. The method of claim 12 wherein the step of depositing the polysilicon film comprises substantially simultaneously flowing SiH_4 and BCl_3 over the surface.
14. The method of claim 13 wherein an average concentration of boron atoms in the polysilicon is between about 7×10^{20} and about 3×10^{21} per cubic centimeter.
15. The method of claim 14 wherein the temperature is between about 450 and about 480 degrees Celsius.

16. The method of claim 15 wherein the pressure is between 200 mTorr and 1 Torr.